Claims:

1. A process for the production of metallic nanoparticles by the controlled electro-explosion of a metallic wire in a suitable medium comprising:
   iii. applying a voltage of greater than 12V to a first electrode and a second electrode, both said first and said second electrodes being formed of the metal whose nanoparticles are desired, said first electrode being in the form of a plate, and said second electrode being in the form of a wire, so as to achieve a spark between the said first and second electrodes, thereby simulating a situation where the second electrode cross-section is pinched or reduced and whereby high current densities are achieved along the length of the second electrode,
   iv. instantaneously exploding both said first and second electrodes by sending shock waves through the bulk of the material, thereby melting the electrodes and dispersing them to form nanoparticles of the metal,
   v. collecting the fragments in a suitable medium such as herein described and recovering the nanoparticles therefrom.
2. A process as claimed in claim 1 wherein the nanoparticles formed in step (ii) above are collected in said medium in order to form a protective capping layer around each nanoparticle so as to prevent the nanoparticle from coalescing into large particles.
3. A process as claimed in claim 2 wherein the capping efficiency is determined by the combination of the metal and the medium in which the metal electrodes are exploded and the nanoparticle size is modified by altering the applied voltage, explosion current density and wire diameters.
4. A process as claimed in claim 1 wherein the second electrode makes contact with the said first electrode in a straight line and intermittently.
5. A process as claimed in any preceding claim wherein the potential difference applied to both the said first and second electrodes is in the range of 12V – 48V DC, preferably 36V DC.
6. A process as claimed in any preceding claim wherein the cross-section of the second electrode is in the range of 0.4411×10^{-5} cm^2 - 1.7721×10^{-5} cm^2 in order to carry current in the range of 0.96×10^6 A/m^2 – 77.6×10^6 A/m^2.
7. A process as claimed in any preceding claim wherein the metal used for forming the electrode has at least a conductivity of 3.5×10^7 (ohm.m)$^{-1}$.

8. A process as claimed in any preceding claim wherein the metal is selected from the group consisting of transition metals, noble metals and Group III metals.
9. A process as claimed in any one of claims 1to 7, wherein said metal is selected from the group consisting of Fe, Cu, Ag, and Al.
10. A process as claimed in claim any preceding claim wherein the medium is selected from water and butanol.
11. A process for the production of metallic nanoparticles by the controlled electro-explosion of a metallic wire in a suitable medium substantially as herein described with reference to the foregoing examples.
12. An apparatus for the production of metallic nanoparticles by the controlled electro-explosion of a metallic wire in a suitable medium which comprises a reaction vessel containing said medium, a first and second electrodes mounted inside said vessel, submerged in said medium, said first and second electrodes being formed of a metal whose nanoparticles are desired, said first electrode being in the form of a plate, and said second electrode being in the form of a wire, so as to achieve a spark between the said first and second electrodes, thereby simulating a situation where the second electrode cross-section is pinched or reduced and whereby high current densities are achieved along the length of the second electrode, said electrodes being connected to a power source so that current is passed through said electrodes, instantaneously exploding both said first and second electrodes by sending shock waves through the bulk of the material, thereby melting the electrodes and dispersing them to form said nanoparticles of said metal.
13. An apparatus as claimed in claim 13 wherein said first electrode is mounted wherein said first electrode is mounted perpendicular to the base of said reactor.
14. An apparatus as claimed in claim 13 or 14 wherein said first electrode is mounted in said reaction vessel through stainless steel slides on an insulating block
15. An apparatus as claimed in claim 15 wherein said insulating block is a plastic block.
16. An apparatus as claimed in any one of claims 13 to 16 wherein said second electrode is mounted in said reaction vessel through a guide.
17. An apparatus as claimed in claim 17 wherein said guide comprises an "L" shaped glass tube, mounted through an insulating mounting means fixed in said reaction vessel.

18. An apparatus as claimed in claim 18 wherein said "L" shaped glass tube is mounted on said insulating mounted means such that it collimates said second electrode, passing therethrough to strike said first electrode along its normal.
19. An apparatus as claimed in any one of preceding claims 13 to 19 wherein said power source is a 12 to 48V battery.
20. An apparatus for the production of metallic nanoparticles by the controlled electro-explosion of a metallic wire in a suitable medium substantially as herein described with reference to the accompanying drawings